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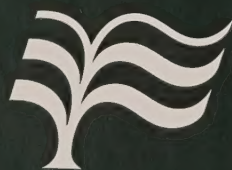
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**A Pictorial Guide on the Ovarian Development of the
Fertile and Sterile Mexican Fruitfly,
*Anastrepha ludens***

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September 1999**

**USDA-APHIS-PPQ
Mission Plant Protection Center
P.O. Box 2140
Mission, TX 78572**

United States
Department of
Agriculture



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THE ADULTS

- adult female (7x)

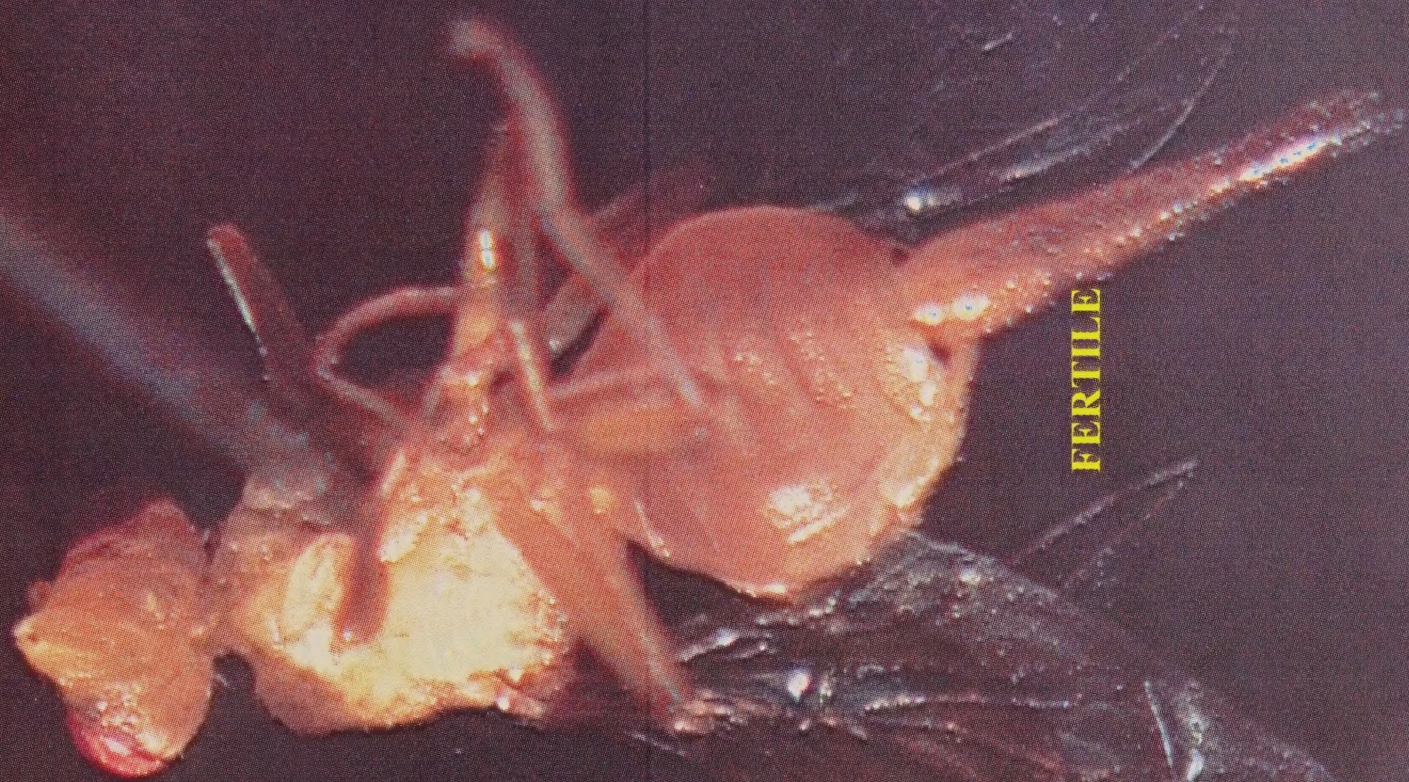
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- sterile vs fertile (6x)

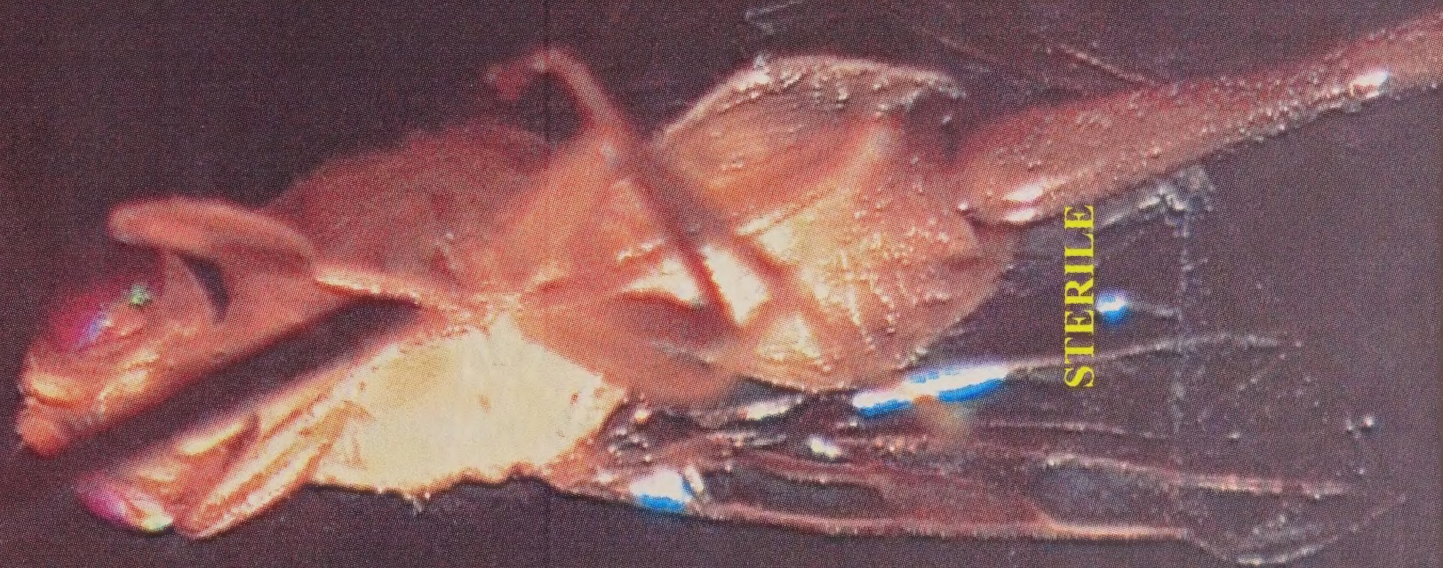
The fertile female's abdomen is enlarged with eggs in the ovaries; however, this is not an accurate identification method and should not be used as an identification tool. This is merely an observation.



Anastrepha ludens (Loew)
Adult female (7X)



FERTILE



STERILE

**Anastrepha ludens, Adult females (6X)
Sterile & Fertile**

SPERMATHECAE

- **non-mated (50x)**

2 of 3 spermathecae

Tissue around these organs can be confused with sperm. Note the difference.

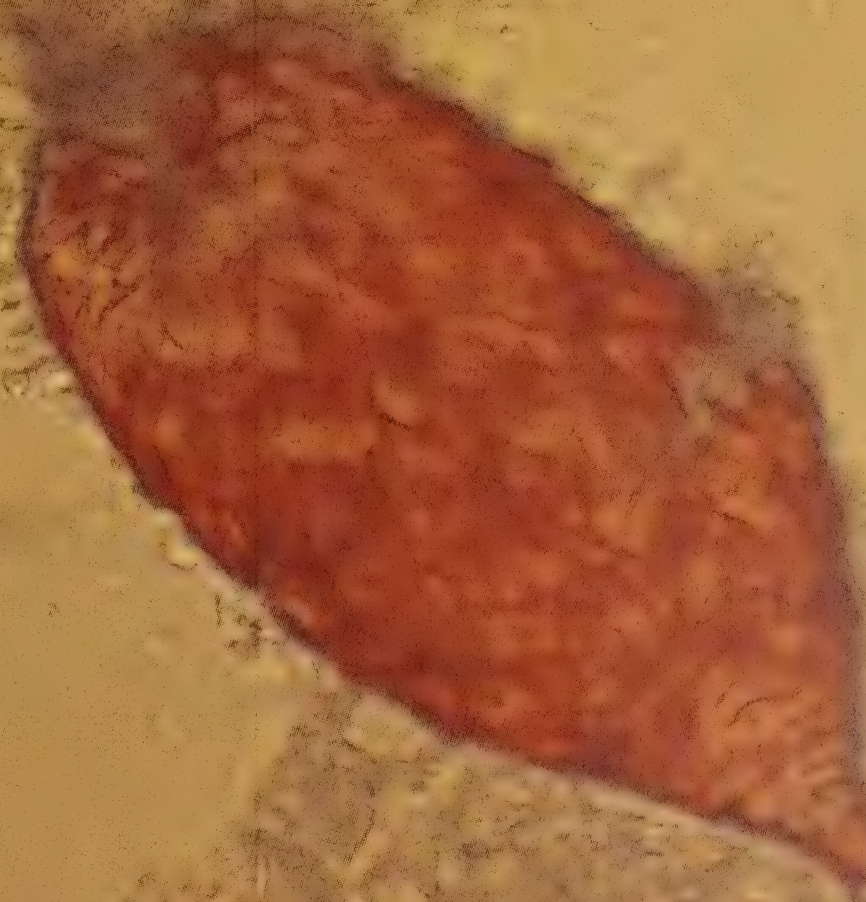
- **mated (200x & 1000X)**

1 spermatheca showing sperm at the apical end.
Sperm can also be detected at end of duct(not shown).



Anastrepha ludens 3-4 days
2 of 3 Spermathecae, Nonmated (50X)

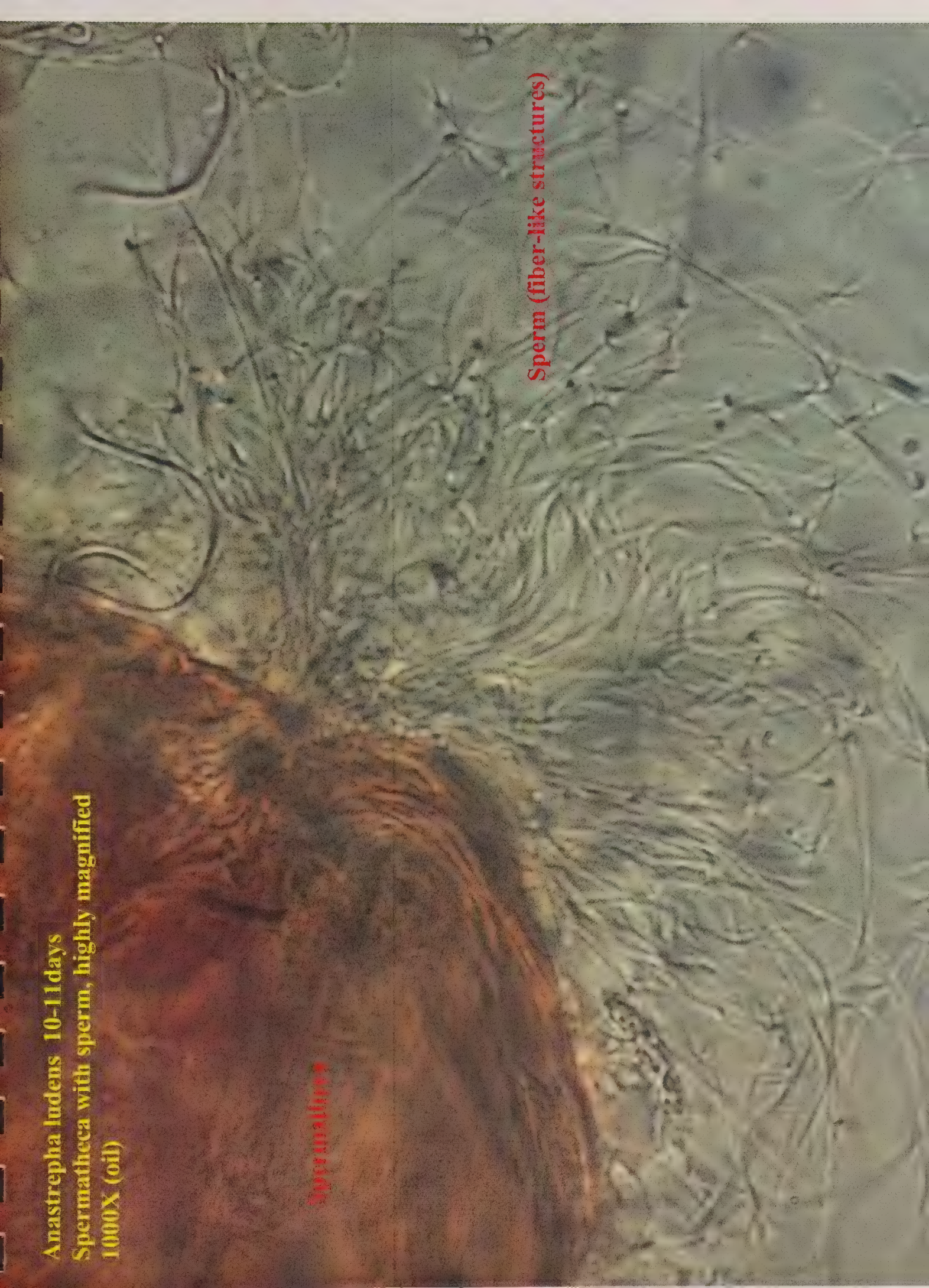
Anastrepha ludens 10-11 days
Spermatheca with sperm (mated)
200X



Anastrepha ludens 10-11 days
Spermatheca with sperm, highly magnified
1000X (oil)

Spermatheca

Sperm (fiber-like structures)



THE STERILE OVARY

- **100x**

Photos of 2 separate flies. The ovaries on 2nd fly appear more organized.

- **1000x**

Upon magnification of 2nd ovary, no definite structures were detected.

**Anastrepha ludens 10-11 days
Ovary with spermathecae (100X)
Sterile female**



Anastrepha ludens - 10 day Sterile
Ovary (100X)



Anastrepha ludens - 10 day Sterile
Ovary (100X w/OH)

No defined internal
structures in eggs



THE FERTILE OVARY

- **2 to 3 days (50x)**

This ovarian stage is the most commonly confused for a sterile fly.

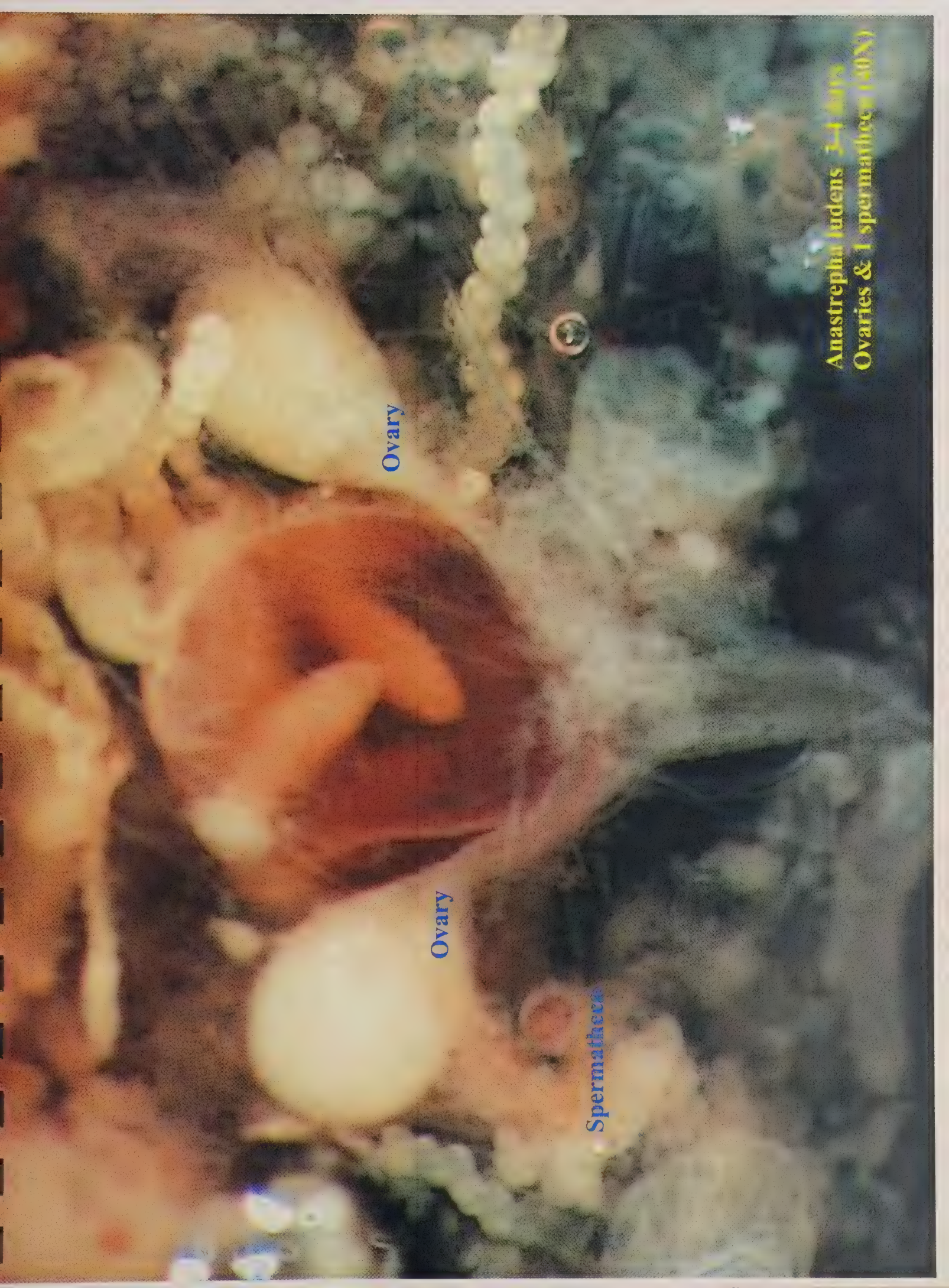
- **3 to 4 days (40x)**

The reproductive organs are as they appear upon dissecting the abdomen. (Orientation Photo)

Ovaries

Spermathecae

Anastrepha ludens 2-3 days
Ovaries & spermathecae (50X)



Ovary

Ovary

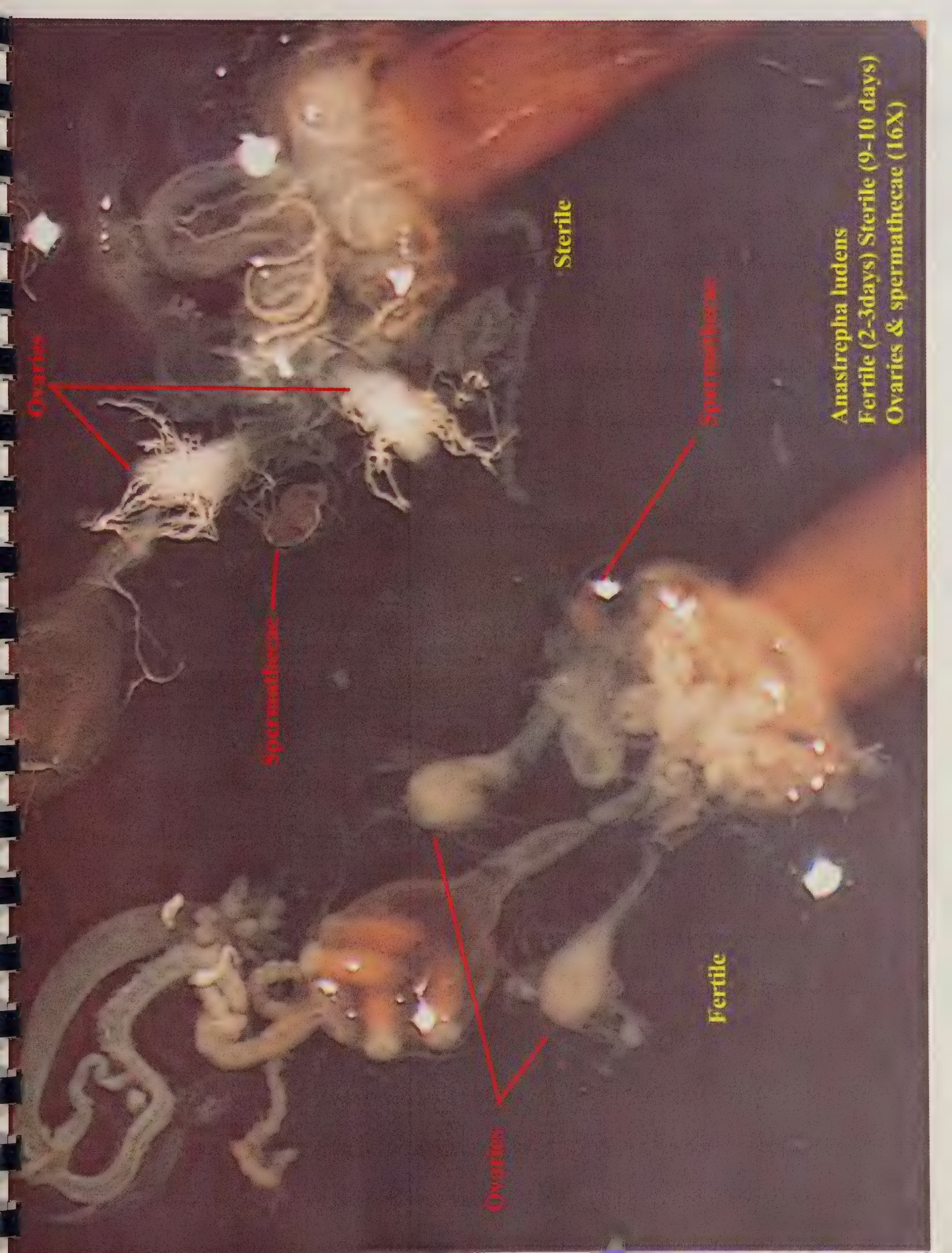
Spermatheca

Anastrepha ludens 3-4 days
Ovaries & 1 spermatheca (40X)

A COMPARISON OF FERTILE AND STERILE OVARIES

- 2 to 3 days (16x)**
- 3 to 4 days (16x)**
- 4 to 5 days (16x)**
- 5 to 6 days (16x)**
- 10 to 11 days (16x)**
- 21 days (12x)**

All sterile ovaries are at the age of release or older (7-10 days).



Ovaries

Spermathecae

Sterile

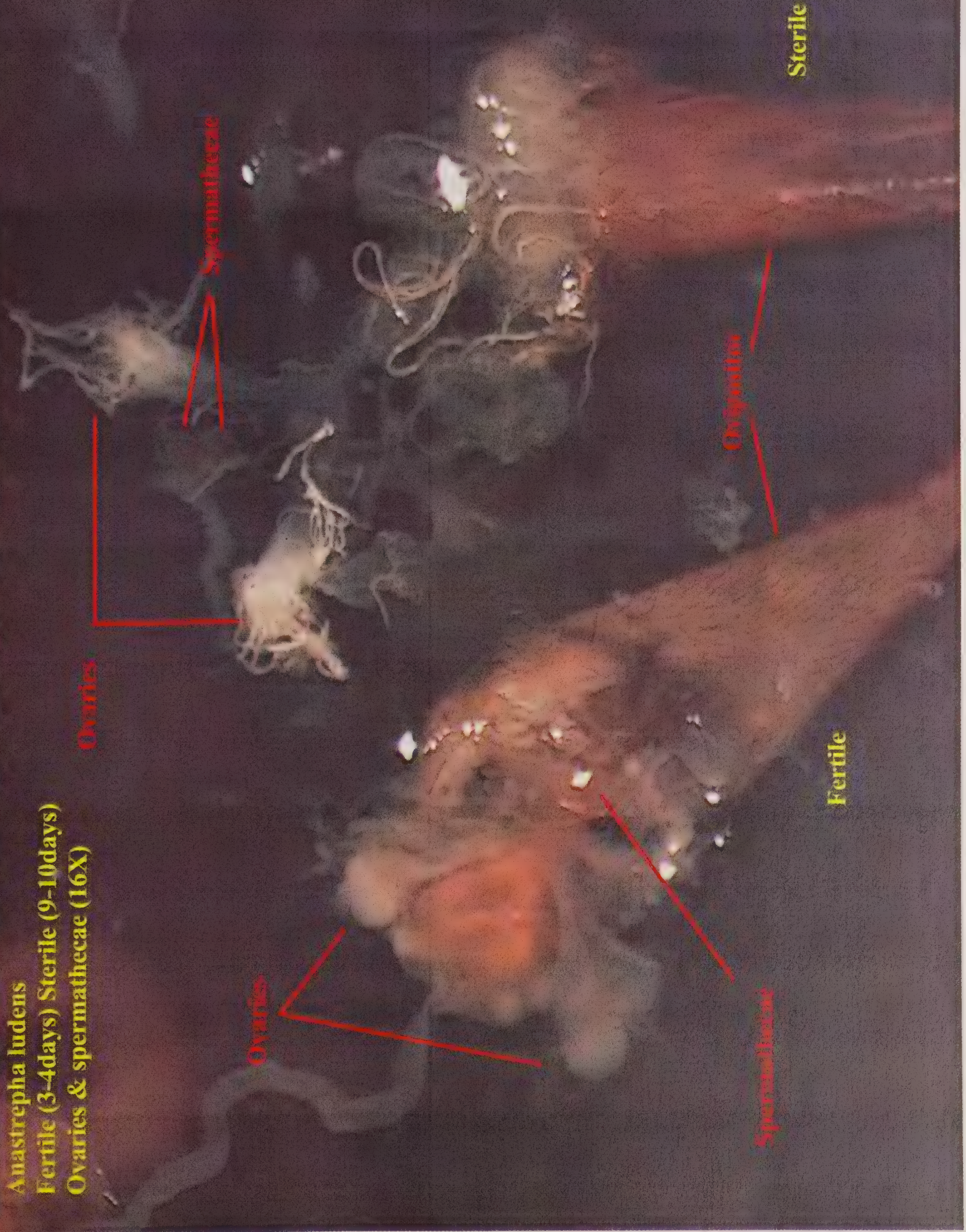
Spermathecae

Fertile

Ovaries

Anastrepha ludens
Fertile (2-3days) Sterile (9-10 days)
Ovaries & spermathecae (16X)

Anastrepha ludens
Fertile (3-4days) Sterile (9-10days)
Ovaries & spermathecae (16X)



Anastrepha ludens

Fertile (4-5days) Sterile (9-10days)

Ovaries & spermathecae (16X)

Sterile

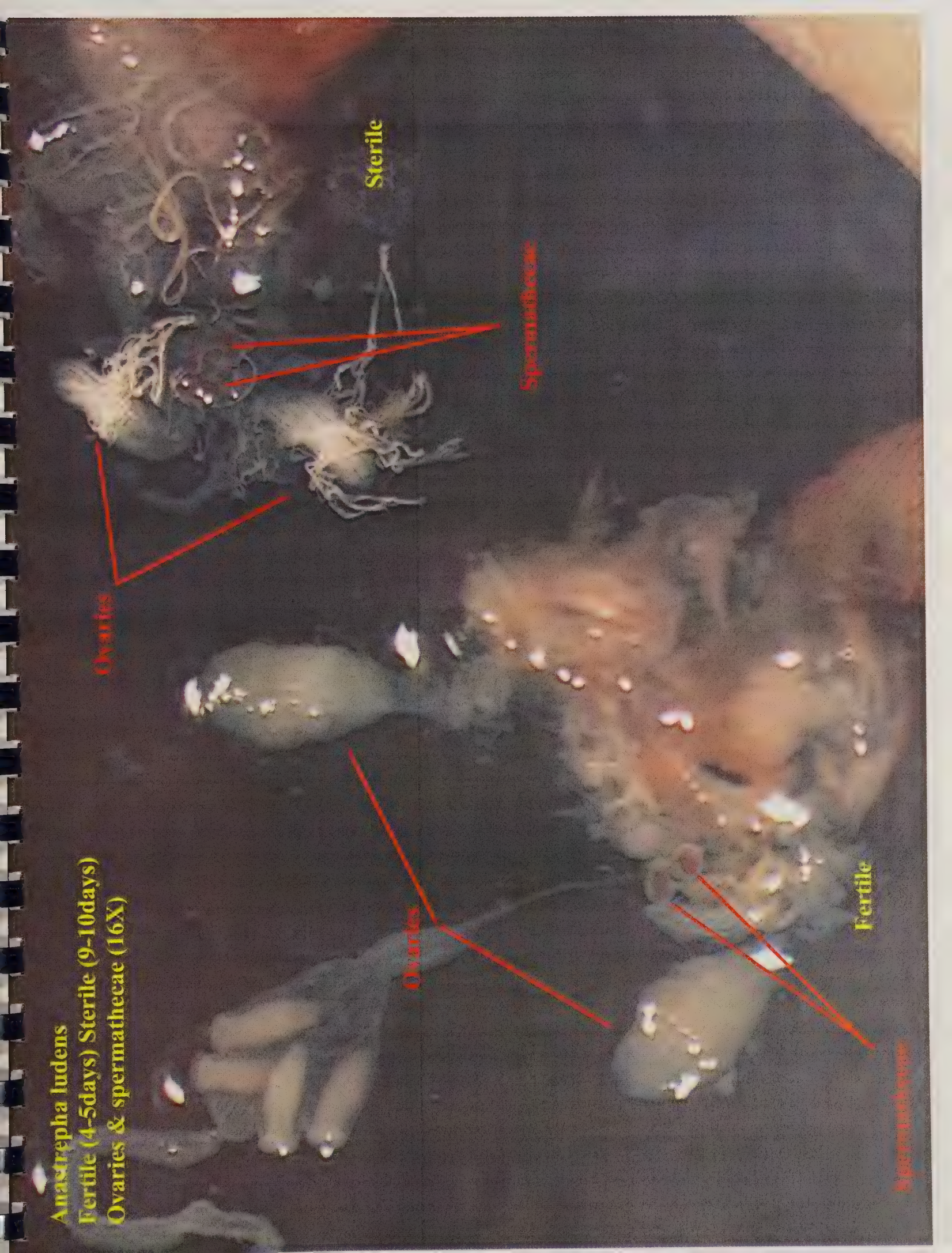
Spermathecae

Ovaries

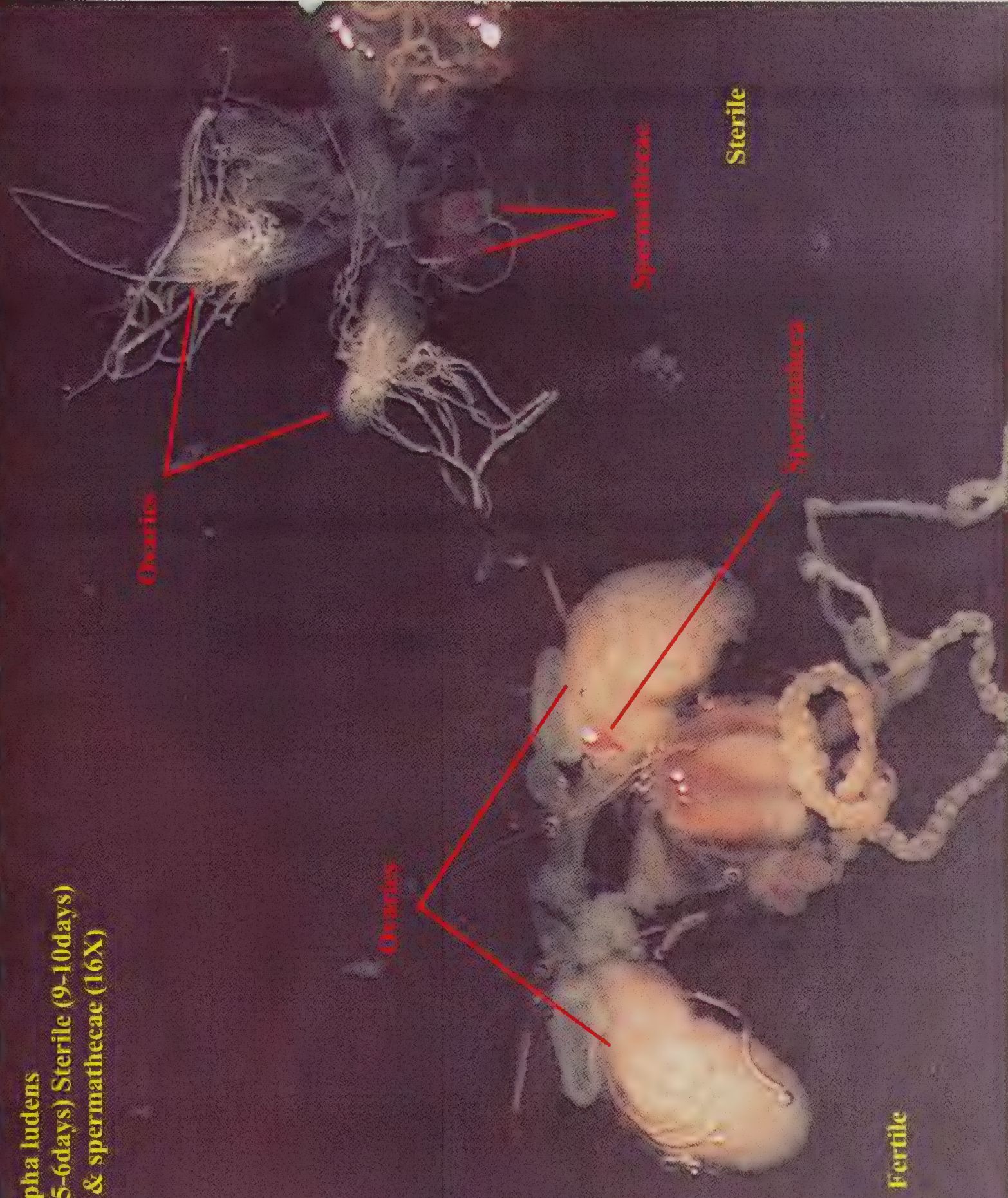
Ovaries

Fertile

Spermathecae



Anastrepha ludens
Fertile (5-6days) Sterile (9-10days)
Ovaries & spermathecae (16X)



Sterile

Spermathecae

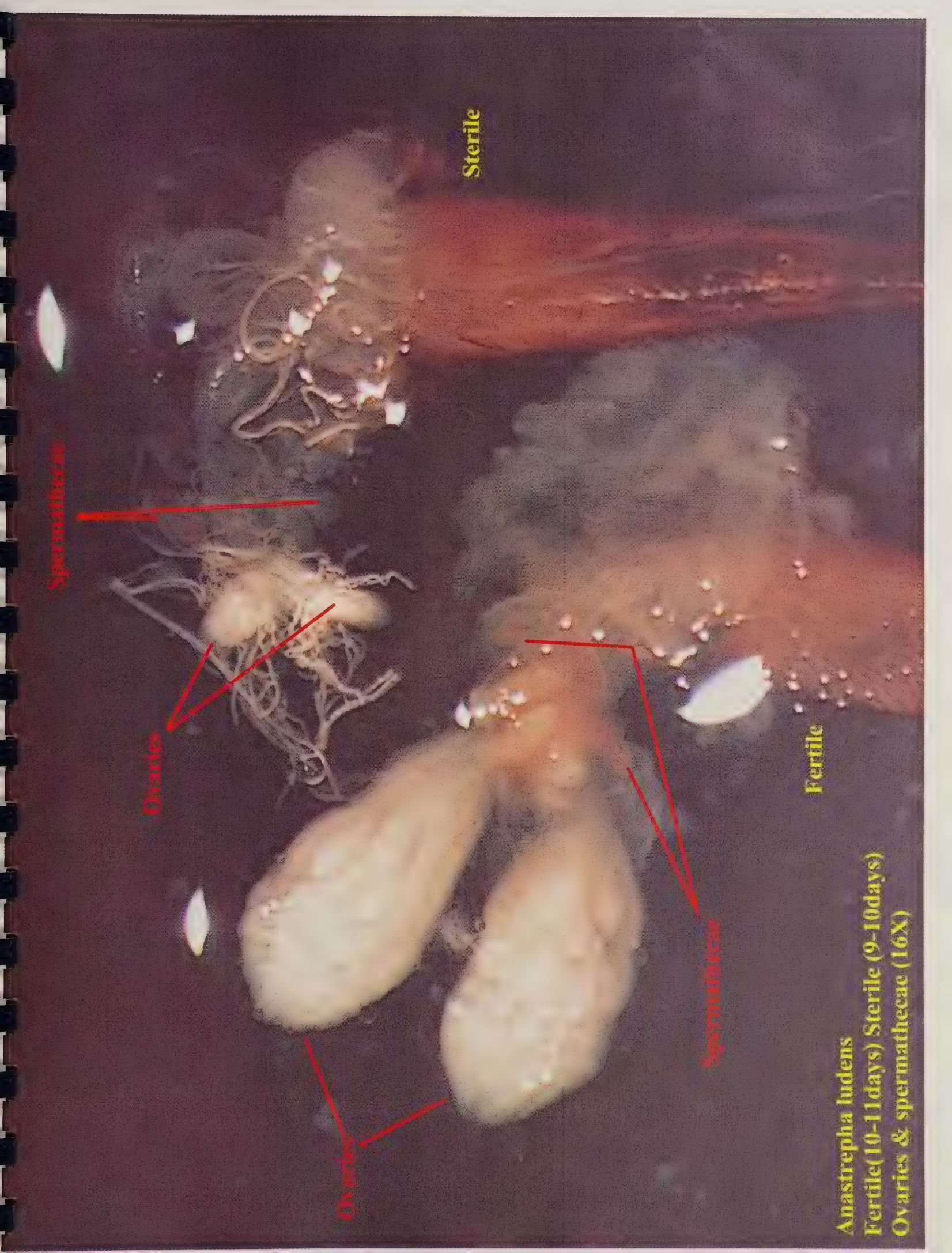
Ovaries

Fertile

Spermathecae

Ovaries

Anastrepha ludens
Fertile(10-11days) Sterile (9-10days)
Ovaries & spermathecae (16X)



Ovaries

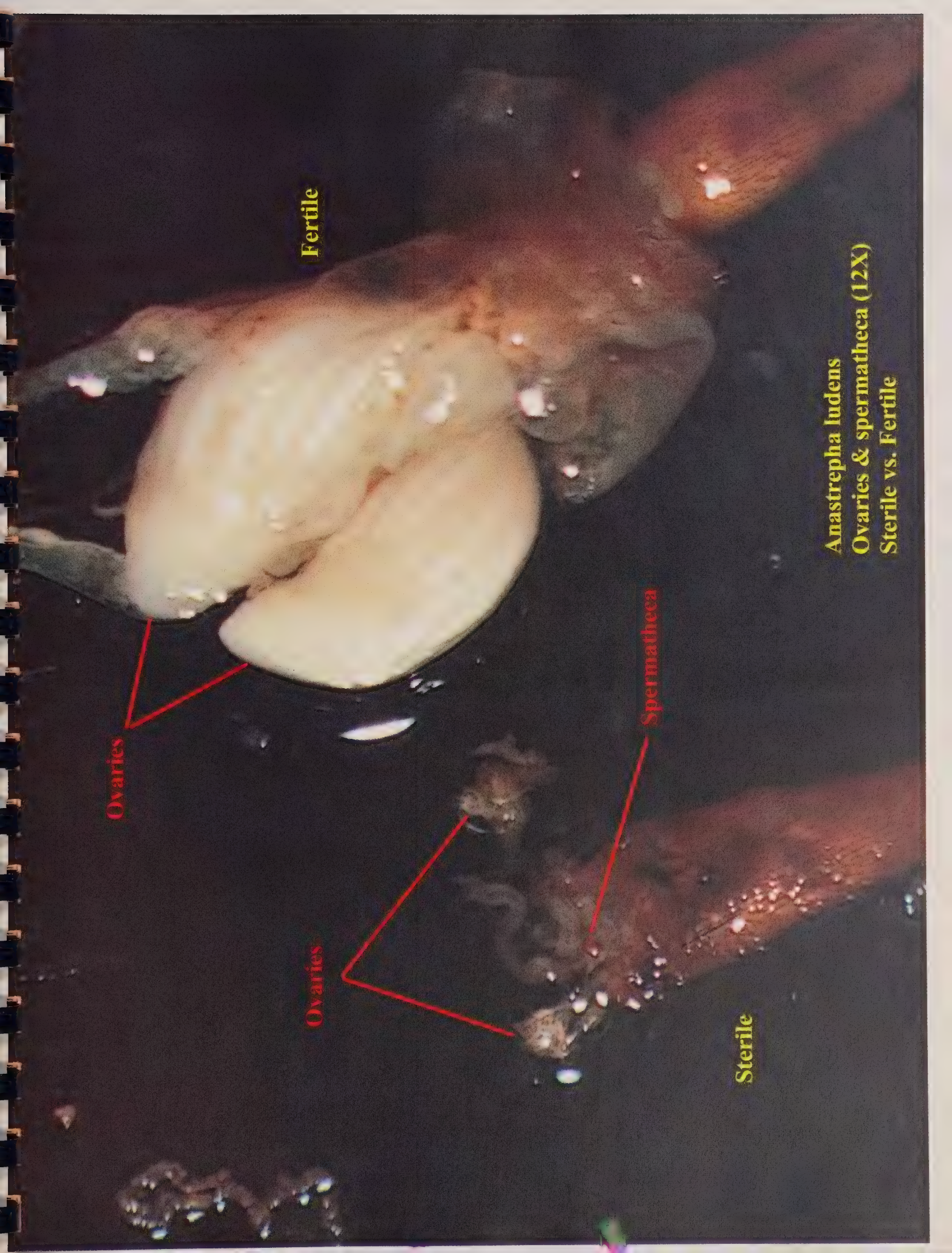
Ovaries

Fertile

Spermatheca

Sterile

Anastrepha ludens
Ovaries & spermatheca (12X)
Sterile vs. Fertile



A CLOSER LOOK AT FERTILE OVARIES

- 2 to 3 days (100x)**
- 4 to 5 days (50x and 100x)**
- 5 to 6 days (50x and 200x)**
- 10 to 11 days (50x and 100x)**



Anastrepha ludens 2-3 days
Ovary (100X)



Egg formation

Anastrepha ludens 4-5 days
Ovary (50X)

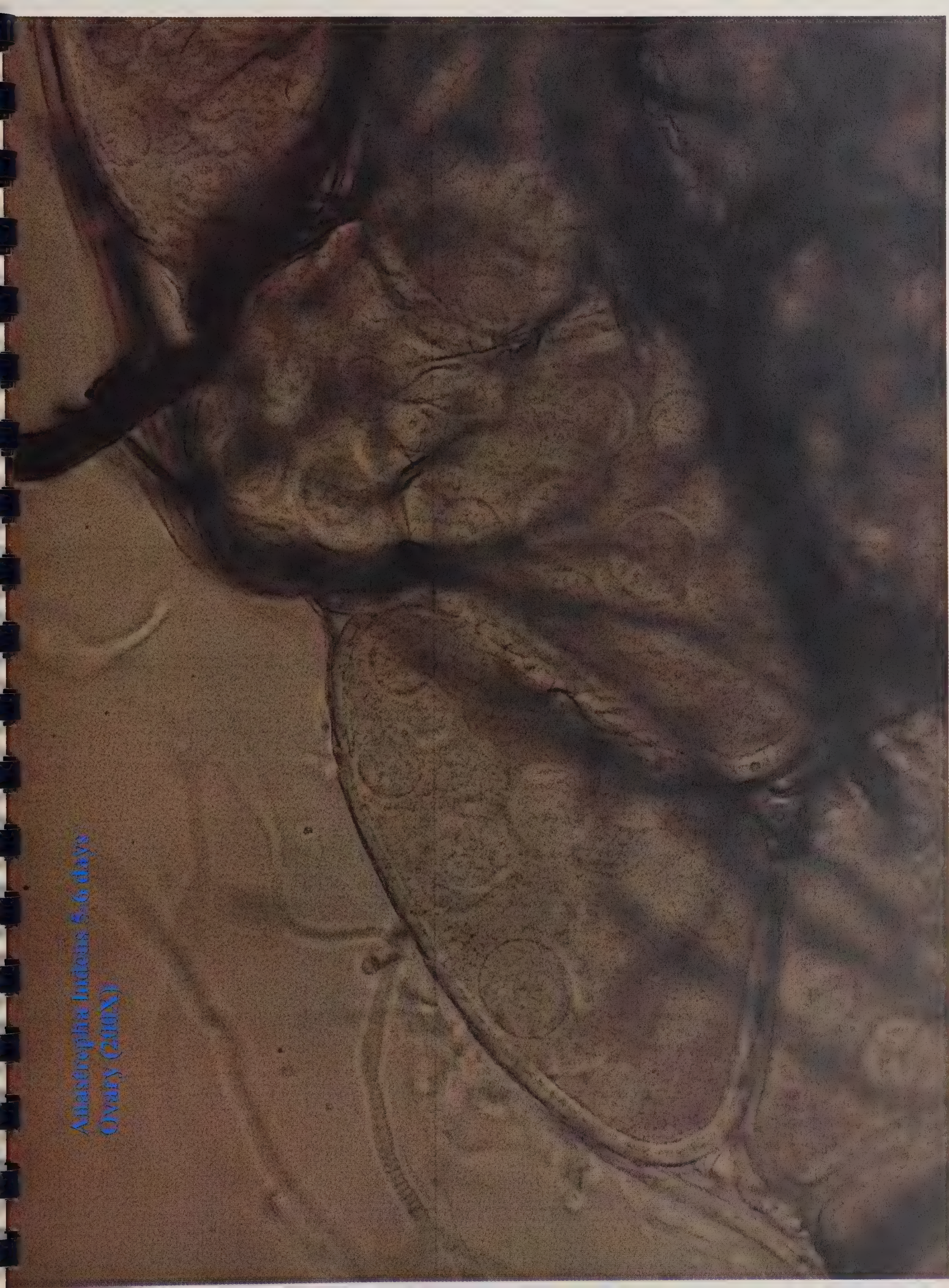
Anastrepha ludens 4-5 days
Ovary (100X)



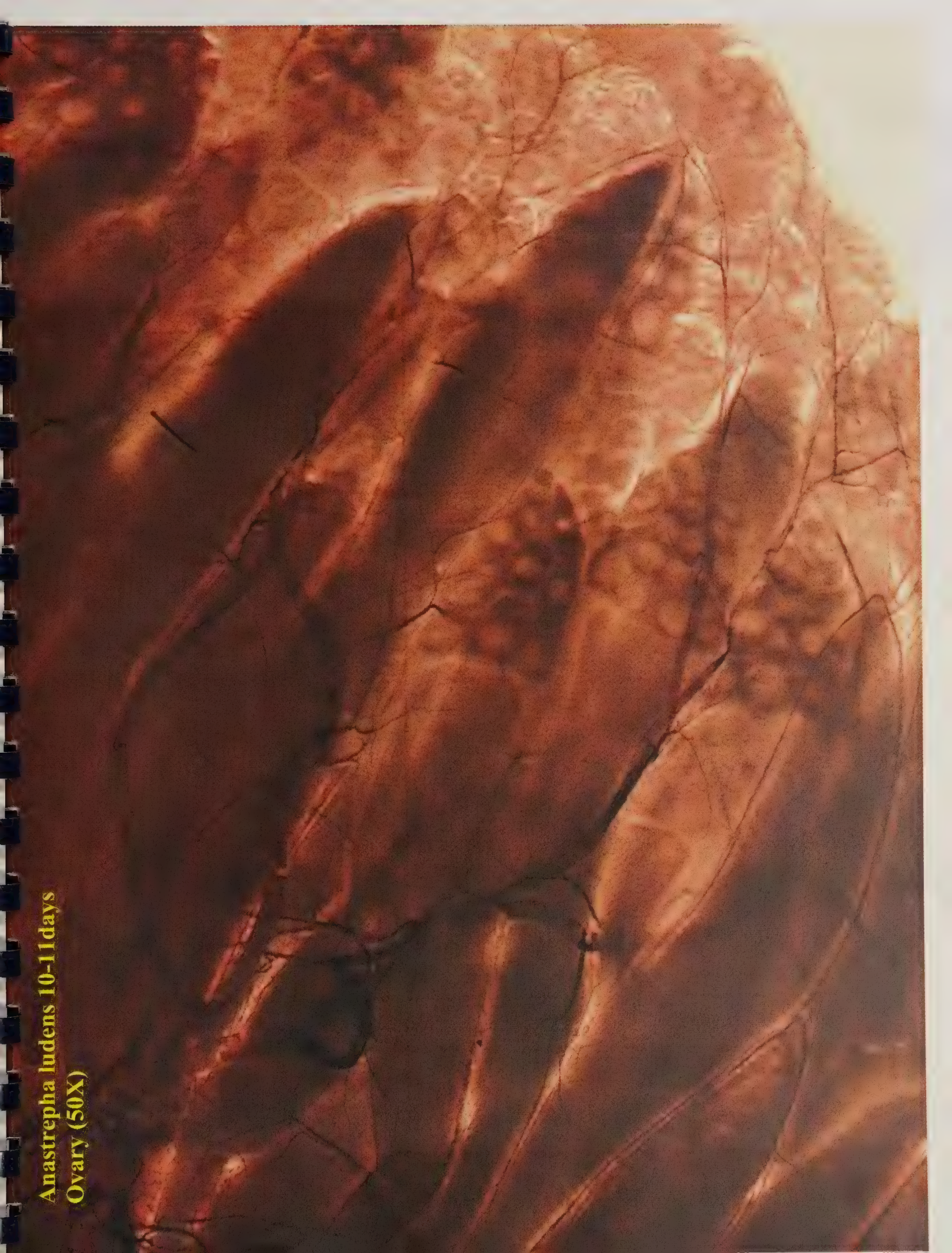
Anastrepha ludens 5-6 days
Ovary (50X)



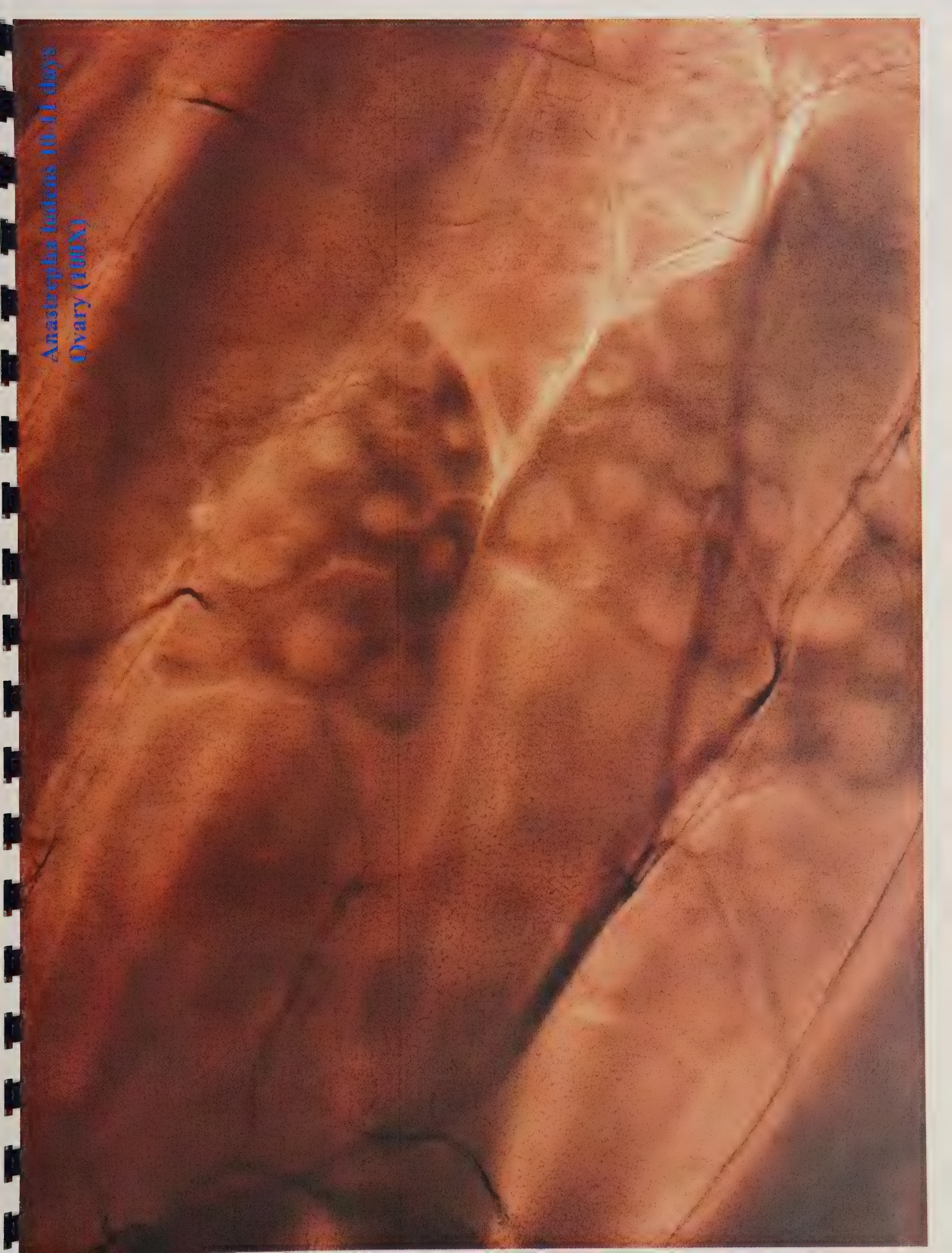
Anastrepha ludens 5-6 days
(ovary 240X)



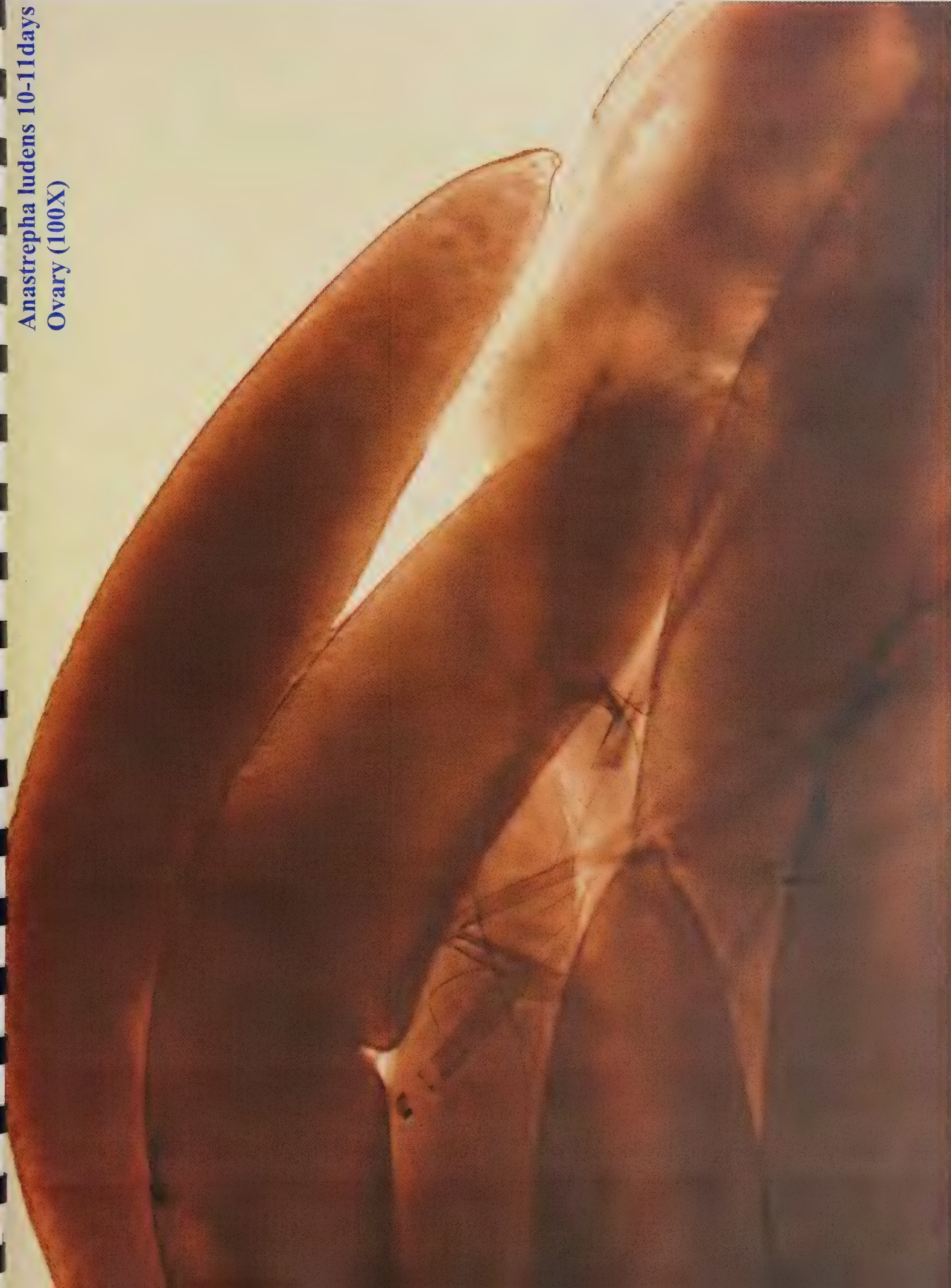
**Anastrepha ludens 10-11days
Ovary (50X)**



Anastrepha ludens 10-11 days
Ovary (100X)



**Anastrepha ludens 10-11days
Ovary (100X)**



VARIATIONS IN MATURE EGGS

- **individual (50x)**
(outside the ovary)
- **several (50x)**
(outside the ovary)
- **multiple (50x)**
(in the ovary)



**Anastrepha ludens - 21 days
Mature Ovum (50X)**

Anastrepha ludens - 21 days
Mature Eggs (50X)



A high-magnification micrograph of an ovary from a 21-day-old *Anastrepha ludens*. The image shows several large, elongated, and somewhat curved follicles. Each follicle contains a large, clear, circular oocyte. The surrounding tissue is stained a deep reddish-brown. The overall structure is complex and layered.

Anastrepha ludens - 21 days
Ovary with mature eggs (50X)

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